APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/902,094	07/11/2001	Shi-Yue Qiu	P 0273746 PAT-002	8093

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EXAMINER
HOGAN, MARY C

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/902,094	QIU, SHI-YUE
	Examiner	Art Unit	
	Mary C Hogan	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>09 September 2004</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   This application has been examined.

2.   **Claims 1-24** have been examined and rejected.

Oath/Declaration

3.   The Oath/Declaration is objected to for the following reasons. It is noted that the application claims priority of prior US provisional applications. However, there is no claim for priority on the Oath/Declaration. A new Oath/Declaration is requested with the application number and filing date of priority documents are listed.

Double Patenting

4.   A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

5.   A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer <u>cannot</u> overcome a double patenting rejection based upon 35 U.S.C. 101.

6.   **Claims 1-10** are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of **Claims 1-10** of copending **Application No. 09897804**. This is a <u>provisional</u> double patenting rejection since the conflicting claims have not in fact been patented.

Claim Objections

7.   **Claims 6 and 10** are objected to because of the following. Appropriate correction is required.

8.   **Claims 6 and 10** state the following: "translating the threshold for the variable to corresponding residual threshold for the residual of the variable", however, the meaning of this claim is unclear from the claim language and the specification, specifically, referring to the word "translating".

9.   **Claims 14,16 and 23: "stationarity"** should read "stationary".

10.   **Claims 16 and 23** refer to "detecting time segments of stationary", however, it is unclear as to what is stationary.

Claim Interpretation

11.   **Claims 6 and 10** state the following: "translating the threshold for the variable to corresponding residual threshold for the residual of the variable", however, the meaning of this claim is unclear from the claim language and the specification. This claim was interpreted to mean that the calculation of the threshold value for a variable includes the computation of a residual value.

12.   **Claim 18** refers to residuals corresponding to future times having "distinct" values based on the time of day, day of week, and week of month. The specification refers to data being collected for inter-day behavior wherein several days of data is collected, data being collected for day-to-day variation wherein several weeks of data is collected **(page 12, paragraph 59)**, and further goes on to show that the residuals are computed using indices that correspond to time **(page 15, paragraph 70)**. From this description in the specification, it was determined that this claim refers to data being collected over a day, week, or month, and the residuals are computed using the data collected over this period of time.

13.   **Claims 13-15 and 24** refer to a "sliding window" being used to determine segments of the variable and the times corresponding to boundaries of these segments. The specification states that a sliding window is an online statistical learning mechanism used to detect sudden statistical changes in a time series variable **(page 17, paragraph 75)**. From this explanation of a "window", it was determined that a window will be of a specified size, and also have boundaries based on this size, and therefore, by "sliding" this window along an axis, the window would perform statistical operations on segments of data. The specification also states that segmentation is performed using a method such as Generalized Likelihood Ratio segmentation to define segments of time in which the statistics of data can be measured **(page 17, paragraph 76)**. From this explanation, it was determined that this segmentation using the Generalized Likelihood Ratio will segment the data along a time axis, and by creating these time segments, the times corresponding to the boundaries are established, therefore, these "segments" that result from the Generalized Likelihood Ratio segmentation, also form "windows". From the descriptions of window and the Generalized Likelihood ratio, it was determined that windowing and the Generalized Likelihood Ratio segmentation are two methods that enable the segmentation of data, thereby creating boundaries at times along an axis of time-series data.

14.   **Claims 16 and 23** refer to "detecting time segments of stationary", however, it is unclear as to what is stationary. It was determined that this claim should be read as "detecting time segments of stationary data", wherein the variable does not change much in the segment.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

15.   **Claims 1-10 and 19** are rejected under 35 U.S.C. 102(b) as being anticipated by Husseiny (U.S. Patent Number 5,210,704), herein referred to as **Husseiny**.

16.   As to **Claim 1, Husseiny** teaches: a system for early warning in an e-service management system, comprising:

a statistical learning mechanism for performing statistical learning based on a plurality of data values of a variable to generate a statistical model characterizing the behavior of the variable **(column 10, lines 65-column 11, line 8, column 17, lines 22-31,** "knowledge based model");

an early warning mechanism for generating an early warning of threshold violation of the variable with respect to a threshold by predicting, based on the statistical model, a future time by which the values of the variable exceeds the threshold **(column 11, lines 44-52, column 18, lines 10-19, column 19, lines 11-13,column 22, lines 19-26)**; and

an operational mechanism for detecting abnormal behavior of the variable based on both the statistical model and the early warning **(column 12, lines 46-53)**.

17.   As to **Claims 2,4 and 8, Husseiny** teaches: the system according to claim 1, wherein the statistical learning mechanism comprises:

an offline normal behavior modeling mechanism for modeling the regular behavior of the variable based on the plurality of values of the variable collected offline over a period of time **(column 4, lines 54-58, column 17, lines 57-60)**; and

an online behavior modeling mechanism for modeling the dynamic behavior of the variable based on a plurality of values of the variable collected online during the operations performed by the operational mechanism **(column 4, lines 42-47, column 18, lines 23-25)**.

18.   As to **Claims 3 and 7, Husseiny** teaches: a method for early warning in an e-service management system, comprising:

modeling the behavior of a variable based on a plurality of data values of the variable

collected over a period of time, said modeling being performed based on the statistical

properties of the data values of the variable to generate a behavior model for the variable, the

behavior model being represented using a plurality of model parameters **(column 4, lines 54-58, column 17, lines 57-60)**;

generating an early warning for a threshold violation of the variable with respect to a

threshold based on a plurality of data values of the variable collected online and the behavior

model **(column 18, lines 10-16, 23-27, 39-41, 45-49, column 19, lines 11-13)**;

detecting abnormal behavior of the variable according to the plurality of data values

of the variable collected online and the early warning **(column 18, lines 45-49)**.

19.   As to **Claims 5 and 9, Husseiny** teaches: the method according to claim 3, wherein generating an

early warning comprises:

computing a plurality of residuals at corresponding different time reference points in

the future based on the model parameters **(column 12, lines 6-9, column 20, lines 21-28)**;

deriving the variances of the plurality of residuals, predicted by said predicting **(column 12, lines 6-9, column 20, lines 21-28)**;

estimating the probabilities for threshold violation of the variable with respect to said

threshold at the corresponding different time reference points in the future **(column 18, lines 39-41,

wherein the ratio of the new incipient failure index to the incipient failure index computes the probability

of a threshold violation)**; and

issuing an early warning for any of the time reference points at which the probability

for threshold violation of the variable exceeds a pre-determined value **(column 18, lines 45-53, column 19, lines 11-13)**.

20.   As to **Claims 6 and 10, Husseiny** teaches: the method according to claim 5, wherein the

estimating the probabilities comprises:

translating the threshold for the variable to corresponding residual threshold for the

residual of the variable **(column 18, lines 23-27, column 20, lines 14-27, wherein the time series analysis

is used to produce the new index, IFI for the new signals measured from sensors, and this time series

analysis includes the calculation of the residual and the variance of the residual (see claim interpretation

above))**;

calculating the probabilities for threshold violation of the residual with respect to the

residual threshold at the corresponding different time reference points in the future **(column 18, lines 39-41**, wherein the ratio of the new incipient failure index to the incipient failure index computes the probability of a threshold violation, and the index calculation through time series analysis included the computation of a residual).

21.   As to **Claim 19**, **Husseiny** teaches: the method as claimed in claim 5, wherein the number of time reference points is a configurable parameter **(column 12, lines 24-45, column 22, lines 9-12, Figure 19)** and the pre-determined threshold violation value is a configurable parameter **(Figure 19, and column 18, lines 10-19, column 22, line 67-column 23, line3)** wherein the thresholds are set based on information in the knowledge base including experience or best estimates, and can be changed an updated as needed since the knowledge base is a "learning" knowledge base that is updated **(column 17, lines 21-25)**, therefore making the threshold a configurable parameter.

Claim Rejections - 35 USC § 103

22.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

23.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.

2.   Ascertaining the differences between the prior art and the claims at issue.

3.   Resolving the level of ordinary skill in the pertinent art.

4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

24.   **Claims 11,12,17,18, 20-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Husseiny** as applied to Claims 1,3,5,and 7 above, and further in view of Bowman-Amuah (U.S. Patent Number 6,427,132), herein referred to as **Bowman-Amuah**.

25.   As to **Claims 11,12,17,20-22 Husseiny** teaches thresholds corresponding to future times **(column 11, lines 44-52, column 18, lines 10-19, column 19, lines 11-13,column 22, lines 19-26)** for detecting abnormal behavior **(column 12, lines 46-53).**

26.   **Husseiny** does not expressly teach the thresholds corresponding to future times being distinct based on time of day and day of week, the residuals comprising a distinct value depending on the time of day, day of week and week of month, and wherein the detection of abnormal behavior is further based on a business process model.

27.   **Bowman-Amuah** teaches thresholds corresponding to future times being distinct based on time of day and day of week **(column 57, lines 6-10),** the residuals comprising a distinct value depending on the time of day, day of week and week of month **(column 27, lines 13-15, 35-36, column 56, line 66-column 57, line 1, column 83, lines 25-31)** in which data is continuously obtained in real-time, and wherein the detection of abnormal behavior is further based on a business process model **(column 2, lines 13-15, column 7, lines 26-28, column 56, lines 62-column 57, line 5)** for use in a simulation of an e-commerce business. **Bowman-Amuah** teaches that the detection of abnormal behavior through the use of thresholds generates an alarm indicating a possible breach of a service level agreement, giving the provider enough time to cure the service level problem before the minimum level is reached and the subscriber's service level agreement is breached **(column 57, lines 58-65).**

28.   It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the thresholds, residuals and detection of abnormal behavior for an early warning system as taught in **Husseiny** with the thresholds and detection of abnormal behavior based on a business model as taught in **Bowman-Amuah** since **Husseiny** and **Bowman-Amuah** are both directed to early warning detection in systems for the purpose of remedying an impending system failure before the detected failure occurs in the system.

29.   **Claims 13,15 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Husseiny** as applied to Claims 1 and 8 above, and further in view of Ammar et al (U.S. Patent Number 6,591,171), herein referred to as **Ammar.**

30.   As to **Claims 13,15,19 and 24, Husseiny** teaches an online behavior modeling mechanism **(column 4, lines 42-47, column 18, lines 23-25).**

31.   **Husseiny** does not expressly teach the online behavior modeling mechanism including a sliding window wherein the width of the sliding window is a configurable parameter.

32.   **Ammar** teaches the online behavior modeling mechanism including a sliding window wherein the width of the sliding window is a configurable parameter **(column 15, lines 60-61, column 16, lines 1-**

2, column 19, lines 7-19) wherein the sliding window is used to improve the probability of detection and reduce false alarm rate and "n" is the configurable size of the window.

33.   It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the sliding window as taught by **Ammar** in the online behavior modeling mechanism as taught by **Husseiny** since using the sliding window, as taught by **Ammar**, improves the probability of detection and reduces false alarm rates **(column 16, lines 1-2)**. Further, both **Husseiny** and **Ammar** are directed to early warning systems that seek to detect the failure of a system **(Ammar: column 33, lines 43-45)**.

34.   **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Husseiny and Ammar** as applied to Claim 13 above, and further in view of Applicant's Own Admission (specification, page 17, paragraphs 75 and 76), herein referred to as **AOA**.

35.   As to **Claim 14, Ammar** teaches a sliding window with a window size "n" **(column 19, lines 7-19)**. This window, when applied to data obtained in the system, computes the probability of a false alarm by segmenting the data based on the window size. From this explanation, it is determined that this window size will determine the boundaries of the segments based on this value of "n" and based on the data that is being segmented. Therefore, if the data is time series data, this window size, "n" will create boundaries on the time axis.

36.   Further, **AOA** states that segmentation along time can be done by the Generalized Likelihood Ratio segmentation method which is known in the art **(page 17, paragraph 76)**.

37.   It would have been obvious to one of ordinary skill in the art at the time the invention was made that the windowing method as taught by **Ammar (column 19, lines 7-19)** could also be performed using a sliding window method as taught by **AOA** since it was determined that the windowing method and the Generalized Likelihood Ratio segmentation method both perform the segmentation of data, and both describe "windows", thereby determining boundaries based on the size of the segments that result **(see Claim Interpretation for Claims 13-15 and 24)**.

38.   **Claims 16 and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Husseiny** as applied to Claim 13 above, and further in view of **AOA**.

39.   As to **Claims 16 and 24, Husseiny** teaches an online behavior modeling mechanism **(column 4, lines 42-47, column 18, lines 23-25)**.

40.   **Husseiny** does not expressly teach the modeling of the behavior including detecting time segments of stationary and the times corresponding to the boundaries of these stationary segments.

41.   **AOA** states that segmentation along time can be done by the Generalized Likelihood Ratio segmentation method, which is a known approach to perform segmentation **(page 17, paragraph 76),** enabling the characterization of the dynamic behavior of a time series variable.
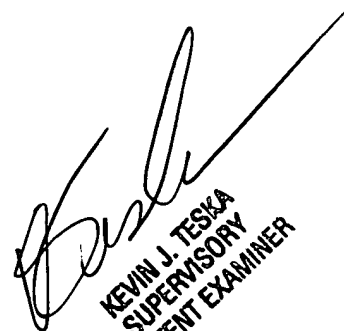
42.   It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the modeling of the behavior of a variable as taught in **Husseiny** by using the segmentation method as taught by **AOA** since **Husseiny** is directed to characterizing the dynamic behavior of time series variables **(Husseiny: column 8, lines 20-27)** and **AOA** teaches that the Generalized Likelihood Ratio segmentation method is a known method in the art used to characterize the dynamic behavior of a time series variable.

Conclusion

43.   The prior art made of record, see PTO 892, and not relied upon is considered pertinent to applicant's disclosure, careful consideration must be given prior to Applicant's response to this Office Action.

44.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary C Hogan whose telephone number is 571-272-3712. The examiner can normally be reached on 7:30AM-5PM Monday-Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on 571-272-3716. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mary C Hogan
Examiner
Art Unit 2123